humimeter.com®
SCHALLER GMBH

User Manual

Biomass moisture meter

humimeter BM2

Version 2.2_en

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2014

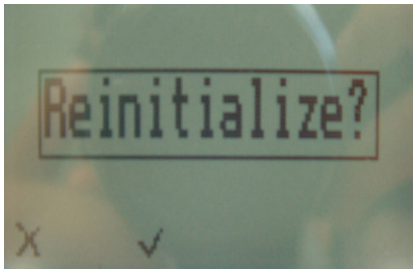
Measuring procedure

1. Place the scale on an even and sturdy work surface. Place the humimeter BM2 in the centre of the scale. **Zero the scale to show 0.00kg.**

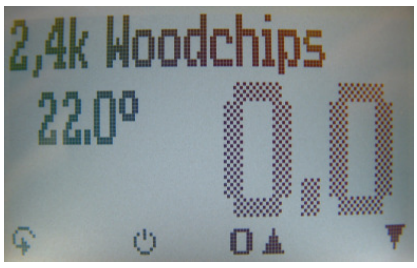
2. Fill the supplied 13 litre bucket with samples taken from varying locations in sample storage.

3. Check that the measuring chamber is completely empty. It is important that no material is left in the measuring chamber when you turn on the device.

4. Switch on the humimeter BM2 by pressing the power button (⏻) for 3 sec.



5. As the next step, please do the self calibration. The word “Reinitialize?” will show up on your display. Accept by pressing the ✓ button.



6. The self calibration is finished when the display shows the measuring window.

7. Fill the measuring device with the sample evenly distributed to ensure reproducible results.

8. Remove material till the next lower weight range is reached. If only a little missing (e.g. 0,10kg) to the next higher level, it should be filled up to that stage. The actual weight is shown on the scale.

9. Smooth the material by hand.

10. **Select the right calibration curve for your material under test using the buttons ▲ or ▼.** The weight of the material in the measuring chamber must be the same as the calibration curve. **The display shows the water content**.

11. If the measure value is blinking, the valid measuring range is exceeded (limits see list on page 5). In this case the accuracy will be decreasing. If you are measuring wood chips, select the next higher weight class and refill wood chips to reach the higher filling weight.

12. To save the results in the save menu press the 🖫 (▲ button). The storage was successful when the number in front of the symbol 🖫 increased. To reach the store menu please press (↻) until the 🖫 appears.

13. To name the saved results press the ✎ button.

14. Empty the humimeter BM2 and ensure that no material rests are accumulated in the measuring chamber.

Measuring process of wooden pellets:

Measure wooden pellets with the calibration curve “5.0k Pellets”. For this measurement the bucket not has to be full of pellets, you must fill in 5,00 kilograms of wooden pellets every time.

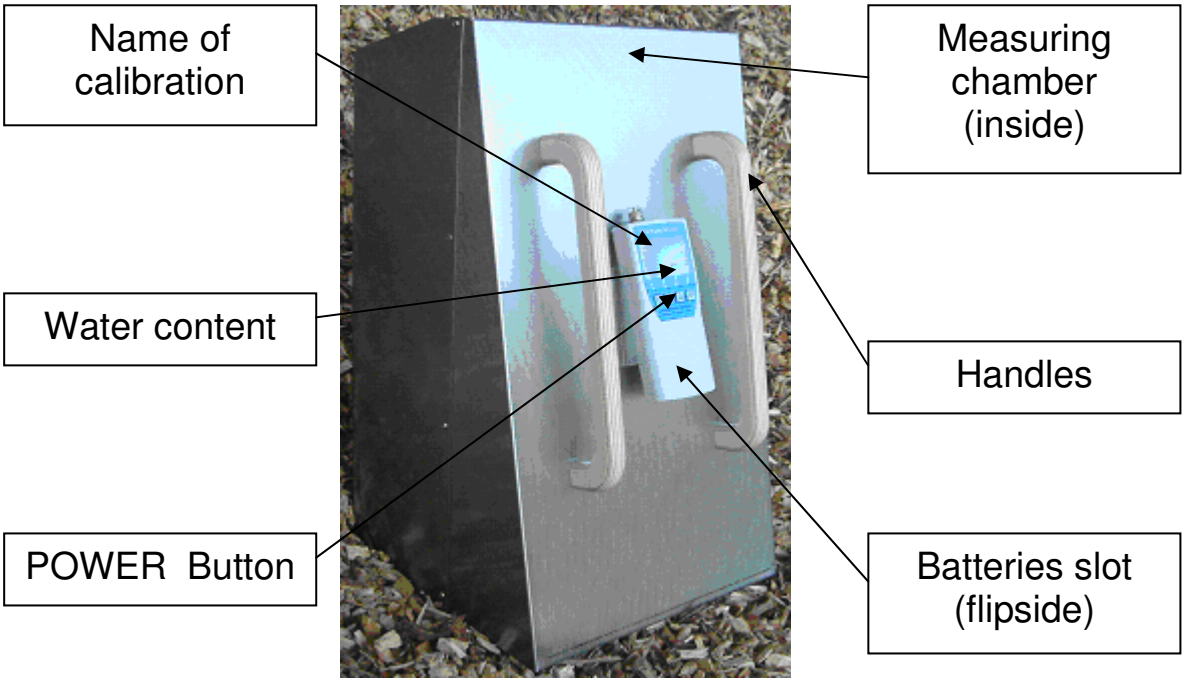
Measuring process of dry wood-shavings:

Is the 13 litre bucket not big enough for 1,00 kilogram of shavings, the measuring device has to be filled separately (e.g. 2 x 0,50kg). During the filling process the measuring material has to be slightly and constantly compressed in the measuring chamber in order to provide enough place for 1,00kg of shavings. After finishing the filling process, all of the measuring material has to be 5cm below the back case edge.

List of calibration curves

Pressing the ▲ or ▼ key in the measuring window for at least 3 seconds and a list with all available sorts will appear. Select your sort by pressing ▲ or ▼ and confirm it with the ↵ key. The measurement will continue automatically.

Design of the device



Calibration curves

Name of calibration curve	Material under test	Filling quantity	Measuring range
2.0k Woodchips	Standard woodchips	**2.00 kg**	5 - 30 %
2.4k Woodchips	Standard woodchips	**2.40 kg**	10 - 35 %
2.8k Woodchips	Standard woodchips	**2.80 kg**	10 - 40 %
3,5k Woodchips	Standard woodchips	**3.50 kg**	20 - 50 %
4.5k Woodchips	Standard woodchips	**4.50 kg**	35 - 60 %
2.8k Coarse WC	Coarse woodchips	**2.80 kg**	10 - 50 %
3.5k Coarse WC	Coarse woodchips	**3.50 kg**	20 - 50 %
2.8k Industr. WC	Industrial woodchips	**2.80 kg**	10 - 50 %
3.5k Industr. WC	Industrial woodchips	**3.50 kg**	20 - 50 %
2.4k P100 chips	Very coarse woodchips	**2.40 kg**	10 - 30 %
2.8k P100 chips	Very coarse woodchips	**2.80 kg**	25 - 45 %
3.5k P100 chips	Very coarse woodchips	**3.50 kg**	35 - 55 %
2.4k Barks	Barks	**2.40 kg**	10 - 35 %
2.8k Barks	Barks	**2.80 kg**	25 - 60 %
5.0k Pellets	Pellets made of wood	**5.00 kg**	5 - 15 %
1.0k Shavings	Shavings	**1.00 kg**	5 - 20 %
1.3k Sawdust	Sawdust	**1.30 kg**	10 - 30 %
2.0k Sawdust	Sawdust	**2.00 kg**	15 - 60 %
1.0k Miscanthus	Miscanthus chopped	**1.00 kg**	10 - 25 %
1.5k Corn cob	Corn cob (without corn)	**1.50 kg**	5 - 45 %
Empty 1	For customer calibration		
Empty 2	For customer calibration		
Empty 3	For customer calibration		
Empty 4	For customer calibration		
reference	To test the humimeter BM2. Not for use of measuring the moisture!		

Selection of the right calibration curve:

Below you can find advices for selecting the right calibration curve. If you are not sure about the right calibration curve, we recommend to carry out a comparison measurement by kiln drying (EN 14774) once.

- **Woodchips:** standard chips of wood (forest wood chips) according to EU-norm EN 14961 class **P16, P31,5 and P45**.
- **Coarse WC:** for coarse chips of wood **P31,5 & P45 but with fewer fines.** *If the weight of the filled 13 litre bucket is under 2,6 kg, the standard wood chips calibration curves (2,4k resp. 2,0k) have to be used!*
- **Industr. WC:** for industrial chips of wood **without barks and fines** (similar **P63**) and **fresh wood chips** (which are not older than two weeks after cutting down the tree). *If the weight of the filled 13 litre bucket is under 2,6 kg, the standard wood chips calibration curves (2,4k resp. 2,0k) have to be used!*
- **P100 chips:** very coarse chips of wood according to class **P100.** *Information: P100 chips are bigger than G100 chips of wood! To avoid filling differences in cause of these coarse chips make more measurements with one sample and note the average!*

Information: There is the possibility to add further existing calibration curves (e.g. shredder, logging debris wood chips) to your humimeter by Schaller GmbH.

Definition of wood chips classes

The stated numbers refer to the particle size that goes through round gaps of the corresponding diameters (e.g. P16 - 16 mm).

- **P16** minimum 75% of the bulk is between 3,15 and 16 mm
- **P31,5** minimum 75% of the bulk is between 8 and 31,5 mm
- **P45** minimum 75% of the bulk is between 8 and 45 mm
- **P63** minimum 75% of the bulk is between 8 and 63 mm
- **P100** minimum 75% of the bulk is between 8 and 100 mm

Activation of the “super user” function

2 times ↯ - *Options* – Unlock

Enter the 4-digit password by using the ▲ button (standard is the 4-digit serial number) and confirm by pressing the ↵ button.

Changing batteries

Your new device is provided with batteries.

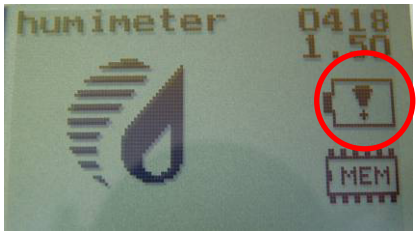
Please find enclosed the manual for fitting and changing of batteries:

1.) Press with your finger onto the arrow of the battery cap und pull it back.

2.) Remove the empty batteries.

3.) Put four new batteries in the device. Make sure that the positions of the battery poles are correct.

4.) Press down the batteries and close the cap.



If the battery symbol appears in the measuring window resp. if a critical charge of battery is shown in the status, the batteries have to be changed IMMEDIATELY. If you do not use your humimeter device for a longer period, remove the batteries. For eventual resulting damages we cannot provide any warranty.

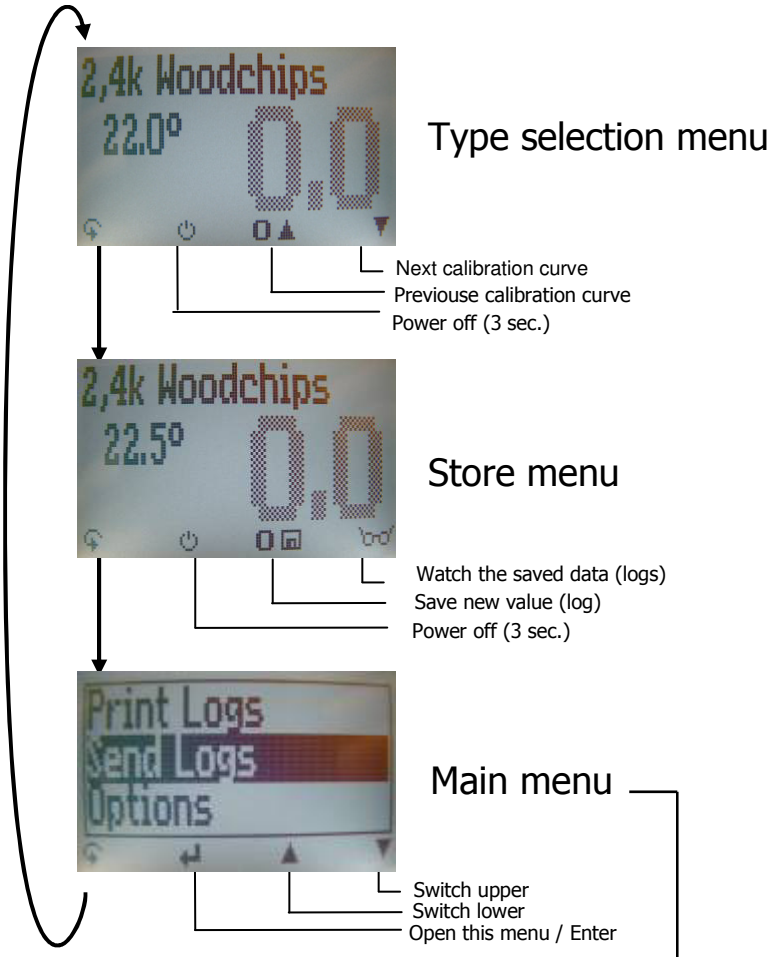
Determination of the material reference moisture

The principle is a comparison measurement with the dehydration method according to EN 14774. Take the measured sample and weigh it. Dry it out in an oven and weigh it again.

$$\%F = \frac{Mn - Mt}{Mn} \times 100$$

M_n: Mass with average moisture content
M_t : Mass of the dried sample
%F: Calculated moisture content

Menu level overview



Overview main menu

Edit Logs	*Options*
Manual Logs	Date / Time
Clear Logs	Log Time
	Language
Print Logs	Unlock
Last Log	°C / °F
All Logs	o Userlevel
Clear Logs	BL On Time
	Auto Off Time
Send Logs	Materialcalib.
Manual Logs	o Online Send
Clear Logs	o Online Print
	Password
Options	Reset
Status	

Keypad symbols

Measuring window:

- Rolling Menu
- Power ON / OFF
- Switch upper
- Switch lower
- Save
- Hold
- Watch the saved data
- Suppliers data can be added

Menu:

- Enter
- Switch upper
- Switch lower
- Exit
- 0..9 Enter numbers
- A..Z Enter letters
- Next or right
- Left
- Yes
- No
- Shift
- OK

Transfer saved data to the PC

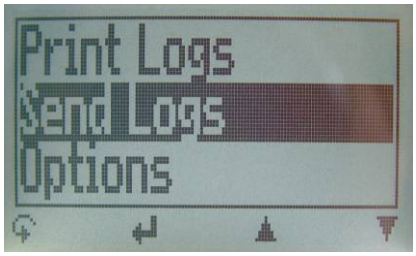
To send your saved logs to the PC, connect the humimeter device to your PC using the USB cable that was delivered with your device. Carefully loose the protection cap on your humimeter and plug in the USB mini B connector. The bigger connector has to be connected to a USB slot on your PC.

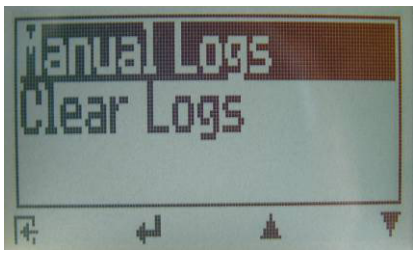
Start the LogMemorizer software on your PC and switch on your humimeter BM2.

The data transfer can be started on your humimeter or on the software.

<u>Starting the data transfer on the humimeter:</u>

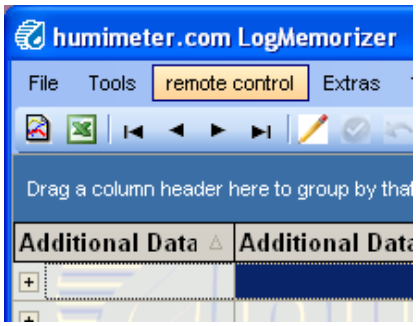
Press the ↻ key until you reach the menu (see image on the right). Then choose „Send Logs“ and confirm by pressing the ↵ key. Now choose „Manual Logs“ and confirm with ↵ again. All saved logs will be sent to your PC.





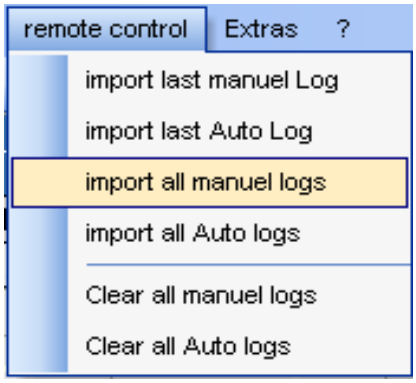
<u>Starting the data transfer on your PC:</u>

Press the button „remote control“ in the LogMemorizer software. A drop-down menu with several options opens (see image below).



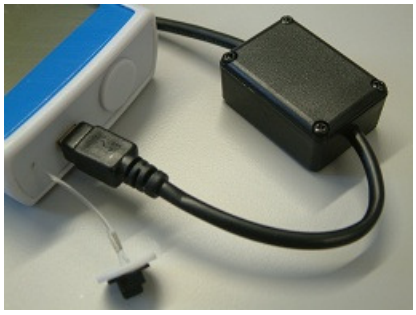
For transferring the data you can select „Import last manual log“ (the last saved measuring series is transferred) or „Import all manual logs“ (all saved logs are transferred).

If you click on one of these menu items, the transfer starts immediately.



For the basic adjustments of the software please look through the instructions on the LogMemorizer USB flash drive.

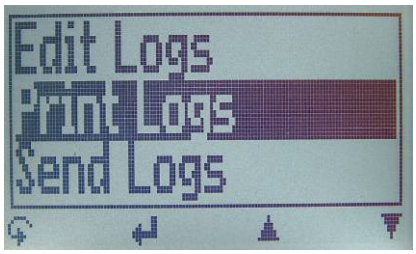
Print saved data



To print your saved data, connect the device to the printer using the printer cable that was delivered with your device. Carefully loose the protection cap on the humimeter BM2. At first plug in the side of the connector with the close plastic casing at the humimeter BM2. Then switch on the device.

Not till then the other side of the cable has to be plugged in at the printer. Switch on the printer by pressing ⏻. Now the green LED is blinking. If it does not blink, please change the batteries and try again.

Press the ↻ button at your humimeter until you reach the menu (see image on the right). Choose „Print Logs“ and confirm by pressing ↵.



Now you can select if you want to print the last saved measuring series or all saved measuring series (logs).

Confirm by pressing ↵ again. The selected logs are printed out now.

To save paper, please think of clearing the data storage regularly.

Online Print and Online Send

Your device supports the function “Online Print” and “Online Send”, this can be activated in the menu „Options“. If an option is active, every newly recorded log will immediately be printed or transferred to the PC after pressing 🖫 key.

Exemption from liability

For miss-readings and wrong measurements and of this resulting damage we refuse any liability. This is a device for quick determination of moisture. The moisture depends on multiple conditions and multiple materials. Therefore we recommend a plausibility check of the measuring results. Each device includes a serial number and the guarantee stamp. If those are broken, no claims for guarantee can be made. In case of a faulty device, please contact Schaller GmbH (www.humimeter.com) or our dealer.

Technical data

Resolution of the display	0.5% water content 0.5°C temperature
Measuring range	5 up to 60% depending on the material
Operation temperature	0°C up to +40°C
Storage temperature	-20°C to +60°C
Temperature compensation	Automatically
Power supply	4 pieces 1.5 Volt AA Alkaline batteries (900 measurements)
Auto Switch OFF	After approx. 6 min. (adjustable)
Current consumption	60mA (with light)
Display	128x64 matrix display, lighted
Dimensions	490 x 290 x 300 mm
Weight	App. 5.3 kg (including batteries)
Degree of protection	IP 40
Scope of supply	**BM2,** Measuring bucket 13 Litre 4 x 1.5Volt AA Alkaline Batteries Software LogMemorizer USB interface for PC transfer USB cable
Necessary accessory	Scale 10 kg (art. no. 11656)

IMPORTANT ! please read

Most common reasons for miss readings

- ***Product temperature out of application range***

  Material **below 0°C** resp. **above +40°C** (32 to 104 °F) may cause faulty measurements. The storage of cold material in a warm storage area usually creates condensed water which may lead to major measuring errors.

- ***Not adjusted material under test***

  Let your humimeter BM2 adjust to the surrounding temperature of the material for approx. half an hour.

  A very high temperature difference has a negative effect on the stability of the measurement results.

- ***Wrong calibration curve***

  Before you measure your sample, double check the correct selection of the calibration curve.

- ***Wrong filling quantity***

  Fill in exactly the right weight (± 0.01kg) of wood chips in the measuring chamber.

- ***Wet or mouldy material***

- ***Frozen measuring material***

Device maintenance instructions

To provide a long life of your device please does not expose it to strong mechanical loads or heat e.g. dropping it or direct sunlight exposure. Clean your device using a dry cloth. The measuring chamber needs to be cleaned with a dry and soft brush.

Any kind of wet cleaning damages the device. The instrument is not rainproof. Keep it in dry areas. When the device is not used for a longer period (6 months) or when the batteries are empty, they should be removed to prevent a leakage of the battery acid.